AMENDMENTS TO THE CLAIMS:

Please amend Claims 25 and 37 as follows:

Claims 1 through 24 (Cancelled).

25. (Currently Amended) An exposure apparatus for performing exposure using EUV or X-rays in a vacuum comprising:

a projection optical system which projects a pattern which is formed on a first object onto a second object by using the EUV or X-rays passing through the vacuum, said projection optical system including a diaphragm in the vacuum irradiated by the EUV or X-rays ~~which is~~ from the first object scattered by the pattern, and a cooling device which ~~cools~~ removes heat absorbed from the scattered EUV or X-rays by said diaphragm during projection of the pattern,

wherein the diaphragm is not irradiated by the EUV or X-rays ~~when no pattern is formed on the first object~~ from the first object not scattered by the pattern.

26. (Previously Presented) An apparatus according to Claim 25, wherein said diaphragm has an opening in its center, said diaphragm setting a numerical aperture of said projection optical system by adjusting the opening, and

said cooling device being located between the opening and an outer edge of said diaphragm.

27. (Previously Presented) An apparatus according to Claim 25, wherein said cooling device comprises a fluid circulation system, which is provided with said diaphragm, in which a temperature controlled fluid circulates.

28. (Previously Presented) An apparatus according to Claim 27, wherein said cooling device controls the temperature of said diaphragm to be almost the same as that of said projection optical system, during the exposure operation.

29. (Previously Presented) An apparatus according to Claim 28, further comprising a constant temperature system for said projection optical system, said constant temperature system providing the temperature controlled fluid to said cooling device.

30. (Previously Presented) An apparatus according to Claim 25, wherein said cooling device comprises a Peltier element.

31. (Previously Presented) An apparatus according to Claim 25, further comprising a sensor which detects temperature information of said diaphragm and produces an output, wherein the temperature of said cooling device is controlled based on the sensor output.

32. (Previously Presented) An apparatus according to Claim 31, wherein said sensor is located at a position not being irradiated with the EUV or X-rays.

33. (Previously Presented) An apparatus according to Claim 32, wherein said sensor is provided on said diaphragm, on a side facing the second object.

34. (Previously Presented) An apparatus according to Claim 25, wherein said diaphragm comprises an iris diaphragm.

35. (Previously Presented) An apparatus according to Claim 25, wherein said diaphragm comprises a turret having a plurality of openings.

36. (Previously Presented) An apparatus according to Claim 25, further comprising a reticle stage for holding a reticle as the first object, a wafer stage for holding a wafer as the second object, and an illumination optical system which illuminates the reticle.

37. (Currently Amended) A device manufacturing method comprising the steps of:

performing exposure in a vacuum of a pattern which is formed on a reticle onto a wafer by projecting EUV or X-rays through the vacuum in which a diaphragm of a projection optical system in the vacuum is irradiated by the EUV or X-rays from the reticle ~~which is~~ scattered by the pattern;

~~cooling~~ removing heat absorbed from the scattered EUV or X-rays by the diaphragm during exposure of the pattern; and

manufacturing a device from the wafer,

wherein the diaphragm is not irradiated by the EUV or X-rays ~~when no pattern is~~

~~formed on the first object~~ from the reticle not scattered by the pattern.

38. (Previously Presented) A method according to Claim 37, further comprising setting, using the diaphragm, a numerical aperture of the projection optical system by adjusting an opening centered in the diaphragm,

wherein the cooling device is located between the adjustable opening and an outer edge of the diaphragm.

39. (Previously Presented) A method according to Claim 37, wherein said cooling device cools the diaphragm by circulating a fluid proximate to the diaphragm.

40. (Previously Presented) A method according to Claim 39, wherein the temperature of the diaphragm is kept to be almost the same as that of the projection optical system, during the exposure operation.

41. (Previously Presented) A method according to Claim 40, further comprising controlling temperature of the projection optical system as well as that of the diaphragm.

42. (Previously Presented) A method according to Claim 37, wherein said cooling device cools the diaphragm by using a Peltier element.

43. (Previously Presented) A method according to Claim 37, further comprising detecting temperature information of the diaphragm with a sensor, and controlling the

temperature of the diaphragm based an output of the sensor.

44. (Previously Presented) A method according to Claim 43, further comprising providing the sensor at a location not being irradiated with the EUV or X-rays.

45. (Previously Presented) A method according to Claim 44, further comprising providing the sensor on the diaphragm on a side facing the wafer.

46. (Previously Presented) A method according to Claim 37, wherein the diaphragm comprises an iris diaphragm.

47. (Previously Presented) A method according to Claim 37, wherein the diaphragm comprises a turret having a plurality of openings.

48. (Previously Presented) A method according to Claim 37, wherein said manufacturing step comprises a resist process and a development process.

Claims 49-52 (Cancelled).